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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/591,829

09/06/2006

Shu Kobayashi

TIP 051

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GARY C. COHN, PLLC
1147 NORTH FOURTH STREET
UNIT 6E
PHILADELPHIA, PA 19123

EXAMINER

WIESE, NOAH S

ART UNIT

PAPER NUMBER

4116

MAIL DATE

DELIVERY MODE

02/04/2008

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/591,829	Applicant(s) KOBAYASHI ET AL.	
	Examiner NOAH S. WIESE	Art Unit 4116	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 09/06/2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-19 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-19 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Status of Application

1. The claims 1-19 are pending and presented for the examination.

Priority

2. Acknowledgment is made of applicant's claim for foreign priority under 35 U.S.C. 119(a)-(d). The certified copy has been filed in parent Application No. PCT/JP05/03949.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

5. Claims 1-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Akiyama et al (The Polymer Incarcerated Method...) in view of Kobayashi et al (US 6352954).

Claims 1-8 are drawn to a polymer incarcerated Lewis acid metal catalyst.

Akiyama et al teaches a polymer incarcerated catalyst wherein palladium catalyst material is incarcerated in a crosslinked polymer (see page 3412, left column). As can be seen in Figure 1c, Akiyama et al teaches a crosslinkable polymer which meets all of the limitations that are given in various combinations in claims 1-8. This indicates that it was known in the art at the time the invention was filed to use crosslinkable polymers equivalent to those of instant application to incarcerate catalytic material.

Akiyama et al differs from instant application in that the catalytic material used is palladium-type catalyst and not Lewis acid metal catalyst. However, polymer-encapsulated Lewis acid metal catalysts were known in the art at the time the invention was filed. These types of catalysts are known to be useful in industry, and thus there would be clear motivation to combine the advantages of the incarceration polymer taught by Akiyama et al with these types of catalysts. Akiyama et al in fact teaches that the method taught in the paper would be expected to be useful to immobilize other metal species onto polymers directly. Other metal species would clearly include Lewis acid metal catalysts.

Kobayashi et al teaches Lewis acid metal catalysts that are encapsulated by organic polymers (see Abstract). Akiyama et al teaches that encapsulation of the catalyst is a necessary first step in the method taught in the paper (see page 3412,

paragraph 2). Thus, Kobayashi et al shows that Lewis acid metal catalysts were known in the art, and that it was known to immobilize these catalysts for use by encapsulation. Therefore, it would be obvious to a skilled artisan to use Lewis acid metal catalysts in place of palladium catalysts in the method taught by Akiyama et al. One would be motivated to make this modification because Lewis acid metal catalysts are recognized as industrially very useful (see column 1, lines 24-28 of Kobayashi. One would not expect detrimental results from the combination because, as stated above, Akiyama et al teaches that the method would be expected to be successful using other metal species. Therefore, claims 1-8 are obvious and not patentably distinct over the prior art of record.

Claim 9 further limits claim 1 by giving a method for obtaining the crosslinkable polymer.

Although Akiyama et al does not teach explicitly the structures of the vinyl monomers used to prepare the crosslinkable polymer, the final structure of the crosslinkable polymer is the same, as can be seen in Figure 1c. Therefore, this process limitation to the product claim 9 is not given patentable weight. (see MPEP 2113). The teachings of Akiyama et al clearly show that the resulting structure of the polymer is equivalent to instant application, and the fact that the structure of the starting monomers is not taught does not give patentable weight to the claim of instant application.

Claim 10 further limits claim 1 by giving a method for obtaining the catalyst.

Akiyama et al teaches that the catalyst is obtained by dissolving the polymer in a solvent that can be Tetrahydrofuran (THF) and then adding the catalyst material (see

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page 3412, left column). This inherently forms a polymer micelle. The polymer and catalyst solution is then crosslinked to incarcerate the catalyst. These are equivalent to the steps of claim 10, and thus with the modification in view of Kobayashi the claim would be obvious over the prior art of record.

Claim 11 further limits claim 1 by giving limitations for the Lewis acid metal.

Kobayashi et al teaches that a preferred Lewis acid metal used is $\text{Sc}(\text{OTf})_3$, which is another way of writing $\text{Sc}(\text{OSO}_2\text{CF}_3)_3$ (see column 4, lines 1-13). Therefore, Kobayashi et al teaches the additional limitation of claim 11.

Claim 12 is drawn to the use of the catalyst of claim 1 in various reactions.

Kobayashi et al teaches that the encapsulated Lewis acid catalysts can be used for Mannich, aldol, Michael, and Friedel-Crafts reactions (see column 4, lines 27-33).

Claims 13-14 further limit claims 2 and 3 by adding further limitations as to the monomer units of the crosslinkable polymers.

As can be seen in Figure 1c, Akiyama et al teach a polymer that comprises monomers that meet the further limitations of claims 13 and 14.

Claim 15 further limits claim 9 by giving a method for preparing the catalyst.

Akiyama et al teaches that the catalyst is obtained by dissolving the polymer in a solvent that can be Tetrahydrofuran (THF) and then adding the catalyst material (see page 3412, left column). This inherently forms a polymer micelle. The polymer and catalyst solution is then crosslinked to incarcerate the catalyst. These are equivalent to the steps of claim 15, and thus with the modification in view of Kobayashi the claim would be obvious over the prior art of record.

Claims 16 and 17 further limit claims 9 and 10 by giving limitations for the Lewis acid metal.

Kobayashi et al teaches that a preferred Lewis acid metal used is $\text{Sc}(\text{OTf})_3$, which is another way of writing $\text{Sc}(\text{OSO}_2\text{CF}_3)_3$ (see column 4, lines 1-13). Therefore, Kobayashi et al teaches the additional limitations of claims 16 and 17.

Claims 18 and 19 are drawn to the use of the catalysts of claim 9 and 10 for various reactions.

Kobayashi et al teaches that the encapsulated Lewis acid catalysts can be used for Mannich, aldol, Michael, and Friedel-Crafts reactions (see column 4, lines 27-33).

Conclusion

6. No claim is allowed.
7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.
8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Noah S. Wiese whose telephone number is 571-270-3596. The examiner can normally be reached on Monday-Friday, 7:30am-5:00pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vickie Kim can be reached on 571-272-0579. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for

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published applications may be obtained from either Private PAIR or Public PAIR.

Status information for unpublished applications is available through Private PAIR only.

For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Noah Wiese
January 24th, 2008
AU 4116

/Vickie Kim/

Supervisory Patent Examiner, Art Unit 4116